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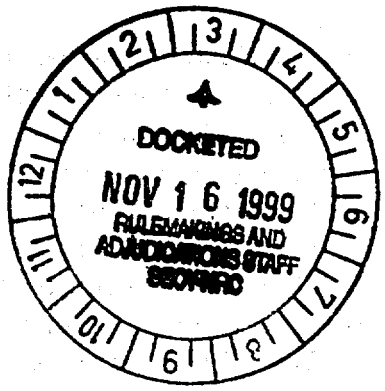

August 30, 1999
99-0870

U. S. Nuclear Regulatory Commission
Mr. Joe Decicco, NMSS/IMNS/OB
Washington, D.C. 20555-0001

Subject: Depleted Uranium Aircraft Counterweights

Dear Mr. Decicco,

We note that the NRC is currently engaged in a rulemaking to establish additional requirements for certain generally licensed devices containing by-product material. We believe that similar concerns are relevant to depleted uranium aircraft counterweights. Although they are not within the scope of the present rulemaking, we believe that these items actually pose a more immediate and larger potential for public exposure. We submitted the comments contained in this letter for consideration in the rulemaking because many of the issues had strong parallels, but we have been informed that an expansion of the current rulemaking scope is unlikely. The following discussion supports the need for additional rules to define and clarify responsibilities for the effective control of depleted uranium counterweights. It also substantiates a pressing need for timely guidance to advise users of the requirements already established for the proper management of these items. Perhaps an IEE notice would be an effective medium for accomplishing this. A summary of key points that should be considered for incorporation in such a notice is also attached.

The problems associated with depleted uranium (DU) aircraft counterweights must be understood in the context of the practices of the aviation industry. Counterweights, made of extremely dense material such as DU, are used to balance the control surfaces of ailerons and elevators to facilitate hydraulic adjustments during flight. When properly marked by a licensed manufacturer, depleted uranium counterweights are currently exempted from all licensing requirements as an "unimportant quantity" while installed on a plane or stored

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or handled incident to installation or removal. The implication, confirmed verbally by the NRC staff, is that when counterweights are removed from service, they lose their exemption. This means that when a fleet is "set down" or a plane is scrapped out, hundreds to thousands of pounds of DU counterweights suddenly become source material requiring a license. When this happens, they are generally in the possession of an organization that has no license and no knowledge of the hazards of the material or of any regulatory requirements. Over the past nine months, we have conducted extensive informal industry surveys that confirm widespread unawareness of responsibilities and the controls that are applicable to depleted uranium aircraft counterweights.

A general license cannot be invoked to control this material because the amount of DU that can be possessed under a general license is limited to 15 pounds. Very few counterweights weigh less than this, e.g. a 1524834-101 counterweight for the L-1011 weighs about 11 pounds. In contrast, an AMC-7226 counterweight from a DC-10 weighs approximately 191 pounds. Most DU counterweights for wide-body aircraft weigh between 20 and 50 pounds. Collectively, the quantities at issue almost always exceed the general license limit because a "ship set" of counterweights includes many counterweights and cumulatively weighs over 1,000 pounds for most aircraft models.

Depleted uranium counterweights were once widely used on the L-1011 Tristar, the DC-10 and the Boeing 747 wide-body commercial aircraft. DU was also used on general aviation planes such as the JetStar. Many military and naval aircraft employed DU for their counterweights. The A-7, F-111, C-5A, C-130, C-141, P-3C, S-3B are examples. Some, like the C-141, continue to use DU counterweights. Others, like the S-3B, are having their counterweights converted to tungsten. Some, like the A-7, have passed out of U.S. service to our allies, along with their DU components. So far we have been unable to locate an authoritative and comprehensive listing of all the planes for which DU counterweights were manufactured and distributed. Researching this may be complicated by the facts that some counterweights were manufactured in Canada and that a primary domestic producer, National Lead of Albany, went out of business in the 80's and decommissioned its Colonie, NY plant. As a result, DU counterweights may be in service on additional commercial aircraft types.

The use of depleted uranium for counterweights fell from favor, and today counterweights for new production aircraft are made from tungsten. A legacy of depleted uranium counterweights remains on the older planes. The total amount of these DU counterweights is difficult to determine accurately because the quantity varies for each different model of the wide-body types. We used

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parts listings and structural drawings to determine the amount of DU in ship sets of counterweights for representative L-1011, DC-10, 747 and JetStar aircraft. Based on the numbers of these planes in existence and a survey of the quantities of some of the counterweights in the inventories of aviation parts suppliers, we estimate that as many as two million pounds may be in service, world-wide, for commercial aircraft. As these planes approach the end of their economical service life, DU counterweights are beginning to enter uncontrolled disposal channels in a rapidly increasing stream.

The average of ages of existing wide-body commercial aircraft are 22.9 years for the L-1011, 23.4 years for the DC-10, and 15.8 years for the 747. Increasing numbers of these planes are now being "set down", "parted-out" and scrapped. Major airlines are knowledgeable enough to insure appropriate disposal of their surplus counterweight spares, although, in the process, they usually store the (now non-exempt) counterweights for prolonged periods without a license. The fate of counterweights entering parts and salvage channels generally consists of abandonment or of transfer to unlicensed operators and disposal in municipal and industrial landfills and other sites. Thousands of pounds are now being so disposed. It is clear that many of these companies are unaware of proper storage and disposal requirements.

Depleted uranium counterweights often remain on aircraft that are retired from service and consigned to long-term storage, parts recovery, or salvage. DU counterweights are corrosion prone but are plated and painted to retard oxidation. When they cease to be maintained in airworthy condition and subjected to systematic inspection, release of radioactive uranium oxides is highly probable. Although military aircraft are not subject to FAA inspection and maintenance directives, recent observations of the C-141 maintenance program confirm that without on-going surveillance, corrosion of DU counterweights can progress to the point where radiological contamination of maintenance facilities and long-term storage areas is threatened. This potential for environmental release could be minimized by terminating the exemption of counterweights on aircraft that are not in active use.

The findings of the NRC Study of Conformity with General License Conditions apply even more emphatically to the possessors of DU counterweights. Ignorance of the hazards and properties of the material and of regulatory controls on alteration, transfer and disposal are virtually total. During our inquiries, responsible managers have casually explained their company's regular procedures for turning over hundreds and thousands of pounds to unlicensed salvage operators and scrap dealers. They obviously have no idea that they are doing anything wrong or violating regulatory requirements. Although counterweights manufactured after 31 December 1969 were required

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to be marked "Unauthorized Alterations Prohibited", we have received anecdotal reports of individuals sawing up counterweights and using them for "bucking bars" to set rivets. State and municipal officials have begun to encounter abandoned counterweights at airports and discarded in trash dumpsters.

A recent incident involving a DU counterweight is illuminating. On 28 July 1999, the NRC published, in its Daily Events Report, an incident in which some Air Force mechanics at Robbins Air Force Base removed a DU counterweight from a C-141 aileron with a hammer and chisel, scattering a small quantity of dust and debris. This incident is now the subject of a formal investigation because someone at the scene was aware of the hazard. The irony of this level of response, while hundreds of thousands of pounds of the same material are being released into the public domain, speaks for itself.

Several complimentary regulatory responses to this situation may be appropriate. The existing regulations urgently require clarification of a number of issues including the point, and the circumstances under which, the exemption from licensing ceases, the length of time counterweights for which there is no demand or use can be stored as exempt material, the extent to which DU-bearing aircraft leaving service can be transferred to unlicensed parts dealers and salvage operators, and the need for radiological surveillance of long-term aircraft storage parks and facilities where counterweights have been stored for protracted periods under unmonitored conditions. As an attachment to this letter, some of these points are defined and discussed in more detail. Many of these issues closely parallel the ones that are being addressed in the current rule-making. This circumstance suggests the alternatives of expanding its scope or of initiating a separate one along similar lines.

In the interim, it is clear that some immediate notification is necessary to advise the organizations currently in possession of depleted uranium aircraft counterweights of their responsibilities to the public. The aviation community is a tightly regulated and law-biding one. There are extremely effective channels of communication with its primary regulator, the Federal Aviation Administration. Perhaps the NRC could take advantage of these existing channels by encouraging the FAA to issue an appropriate advisory bulletin informing the aviation community of its responsibilities for managing depleted uranium counterweights. An effective and practical solution must clearly involve the active participation of the aviation community and must be based on a detailed understanding of the realities that govern its daily activities and operations.

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The management of depleted uranium aircraft counterweights is a real problem that merits serious regulatory review. At this stage, it can probably be brought under control, and previous inappropriate disposals and releases can be corrected and remediated. If I can provide any additional information or insights, I will be glad to do so.

Sincerely,

Donald A. Barbour
Project Manager, Depleted Uranium Programs

Enclosures

c Dr. Thomas T. Holloway, Manager
Environment, Energy, and Employee Safety Division
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UNRESOLVED ISSUES AND QUESTIONS RE DEPLETED URANIUM AIRCRAFT COUNTERWEIGHTS

1. When an airline or operator "sets down" a fleet of DU-bearing aircraft, how long does it have to effect disposition of spare parts inventories of DU counterweights before it needs to apply for a source material license to maintain possession of them? Based on informal conversations with the NRC staff and with state regulators, one interpretation is that DU counterweights lose their exemption from licensing when they are no longer intended for their original use. Criteria based upon intent (such as intent to sell surplus counterweights to another operator) tend to be difficult to enforce. As aging planes are retired and "parted out", spare parts inventories will predictably swell even as real demand disappears, along with the number of aircraft to be supported. This development would reflect the fact that it may be cheaper to store DU counterweights indefinitely rather than to pay the costs of authorized disposal. Frequency of demand or period of non-use might afford one objective tool for determining the credibility of a representation of intent for future use. The NRC encountered an analogous problem in enforcing its requirement that licensees clean up and decommission their unused facilities. Licensees deferred clean-up costs by claiming possible future uses. The NRC finally promulgated the "Timeliness Rule", which requires that, if a licensed facility has remained idle for two years, the decommissioning process must be initiated. Perhaps, by analogy, DU aircraft counterweights should lose their exemption from licensing if they have not been used in flight (or, for a particular part number, have experienced no demand) for a specified period. Another objective indication of intended use relates to how the part is managed. Modern commercial aircraft incorporate over one million different parts. They are almost always managed by an automated data processing system. All parts are classified in such a system as either "repairable" or "consumable". Another common industry term for parts that may be economically repairable is "rotable". "Consumable" parts, on the other hand, that do not meet criteria for airworthiness are automatically directed to disposal channels. The "system" will not allow the issuance of a repair order for a "consumable" part. Categorization of DU counterweights as "consumable" parts in an organization's ADP system is therefor a clear indication that such a part loses its exemption from licensing as soon as it is removed from an aircraft.

2. Presumably, the exemption from licensing for DU counterweights, stored incident to installation on an aircraft, applies to counter-

weights in the inventories of aviation parts dealers who are attempting to sell them back to operators and maintenance organizations for their originally intended use. Do such counterweights, that are held in storage for a specified period without being sold, lose their exemption from licensing, requiring the aviation parts dealer to apply for a source material license or to transfer the parts to an appropriate special licensee, e.g. for controlled disposal?

3. Can DU counterweights in the possession of a salvor, scrap dealer, or parts broker be considered as exempt from licensing because of a (theoretical) possibility of future use on an aircraft? Such organizations often acquire parts (such as DU counterweights) that they do not expressly want because they are included in a large-scale consignment, transaction, or inventory transfer along with other high demand parts. An important factor in making such a determination should be the recognition that the Federal Aviation Administration requires a documentation of airworthiness for all parts used on an aircraft. This is effected by means of a completed FAA Form 8130-3 (Airworthiness Approval Tag) (or JAA Form One or equivalent for foreign carriers) that must accompany the part. Counterweights coming out of a tear-down facility would have to be shipped to an FAA licensed repair station for inspection, repair (if required), and issuance of the FAA Forms 8130-3 before they could be put to their original intended use. This is an expensive procedure and is not economically justified by the current negligible demand for DU counterweights. If a scrap or parts dealer accepted a consignment of material from an aircraft tear-down facility and did not obtain accompanying FAA Forms 8130-3 for the counterweights, it would be a good indication that there was no realistic prospect for their reuse. In fact, transfers of counterweights, without Forms 8130-3, from a tear-down activity to an unlicensed scrap or parts dealer is probably inconsistent with the intent of the regulations. From the time that DU counterweights are removed from an aircraft and enter either parts or salvage channels, the possessor should bear the burden of demonstrating a realistic probability of reuse, either by obtaining Forms 8130-3 immediately upon transfer or by other affirmative means.

4. Do DU counterweights installed on an aircraft lose their exemption from licensing if they remain installed on an aircraft that is placed in long-term storage, "moth-balled", or transferred for "parting out" or salvage? Aircraft that are not maintained in airworthy condition and subjected to periodic inspections and maintenance will eventually experience corrosion of counterweights and release of radioactive oxide onto storage areas and into the adjacent environment. The FAA defines an aircraft as a device intended for

flight, so aircraft taken out of service cease to be aircraft in its view. If installation, even on a non-operational aircraft, qualifies the counterweights for exemption from licensing, it means that the parts company performing a tear-down could remove engines, avionics and other high value components for refurbishment and reuse and leave the counterweights attached to the carcass consigned for scrapping. At what point does the stripped aircraft cease to be an aircraft? Can the DU counterweights be left attached to a bare airframe or a subassembly and legally abandoned?

5. Under the proposed rule-making, devices containing by-product material that were stored for two years without being used are going to require disposition. By analogy, should depleted uranium counterweights installed on aircraft parked in long-term storage and not flown for a specified period lose their exemption? Would the owner/operator of the storage facility be required to obtain a source material license, remove the counterweights and place them in controlled storage, or perform periodic radiation monitoring and surveillance to insure against release of corrosion products into the environment?

6. Military aircraft with DU counterweights, e.g. the A-7 Corsair, have been transferred to allied governments through foreign military sales. The gaining organizations are not always aware of the presence of the DU or of the controls that are appropriate. The notifications and information requirements that are appropriate to such transfers should be established.

SUGGESTED POINTS FOR AN INFORMATION NOTICE

- Depleted uranium (DU) counterweights installed in aircraft are exempt from the requirements for licensing.
- The exemption also applies to counterweights that are being handled or temporarily stored incident to installation or removal.
- When these conditions are not met, DU counterweights are not exempt, and an organization must possess an NRC (or "agreement state") radioactive material license to retain possession of them.
- When DU counterweights lose their exempt status, there are three ways by which they may properly be brought under license control. The possessor may apply for his own radioactive material license. He may, alternatively, contract with a special licensee whose "umbrella" type license authorizes him to provide radiological protection support services to a third party. He may also transfer the counterweights to a special licensee, such as a radioactive waste broker, for authorized management or disposal.
- Depleted uranium aircraft counterweights may not enter unlicensed disposal channels. Transfer of DU counterweights to unlicensed scrap dealers, salvors, or disposal facilities is prohibited.
- The exemption of counterweights from licensing while they are being stored incident to removal or installation is not an exemption for indefinite storage. Factors and circumstances that would indicate counterweights were not exempt from licensing include: low recorded demand for a counterweight part number or prolonged storage period for a particular counterweight, lack of a current accompanying FAA Form 8130-3 (Airworthiness Approval Tag), classification of a removed counterweight as a "consumable" part in the organization's automated data processing system (part not subject to repair orders), existence of a corporate decision or policy to replace DU counterweights with tungsten equivalents, and accumulation and storage of counterweights under conditions similar to those applied to scrap materials or wastes.
- Counterweight users should be aware that the uranium oxide corrosion products from improperly maintained counterweights are radioactive, chemically toxic, and easily spread. Maintenance and storage areas where depleted uranium corrosion products have been released should be radiologically surveyed. Radiological contamination of facilities should be reported to the NRC or appropriate state agency so that required clean-up actions can be verified.